TRAFFIC SIGNAL TECHNICAL WORKSHOP
Wednesday, December 1, 2010

Welcome & Review of Last Meeting Minutes – Greg Fuller
Greg briefly touched on major items of last workshop held April 10-11, 2007. One item was the change of loop lead-in cable from multi-pair #18 AWG to single pair #14 AWG. The group had no problem with this change. Greg introduced Lacy Love, Director of Asset Management, who recognized the group and the importance of their work.

MOE Projects – Greg Fuller
Over 650 NEMA cabinets and controllers were replaced with 2070L controllers and over 200 flashing yellow arrows were implemented using MOE funds. We spent approximately $15,350,000 in accomplishing this work. Everyone involved with this initiative deserves credit and recognition for doing an exceptional job!!

Significant Changes to the MUTCD – Part 4 – Buddy Murr

- Final approval of 4-section FYA display for protected-permitted displays.
- Final approval of 3-section FYA display for permissive displays (MUTCD does not recommend using a RYG display centered over left turn lane).
- Protected-only mode left-turn faces must use Red Arrow and use of "Left Turn Signal" sign with Left Red Arrow is a violation. Scheduled PMs are the perfect time to take down those particular signs.
- For new/upgraded ped signals, we will use countdown heads regardless of the change interval. However, if ped change is 7 sec. or less, pedestrian countdown signals are not required by MUTCD.
- Use of 3.5 feet per second walking speed in calculating pedestrian clearance intervals.
- One head per through lane is recommended for design speeds 45 mph or more.
- Hybrid Pedestrian Beacons (the "Hawk") are approved devices for pedestrian crossings where stop-and-go traffic signals may not meet warrants.
- Backplates are a "should" condition. They will not be shown on new designs unless specifically requested. Prior approval by the Regional Signal Engineer is required before removing backplates. After approval the backplates can be removed and a plan will be provided at a later date. Prior approval is not required to add backplates but the Division will submit it as a Plan of Record. If installed, they must be maintained.
- There is a new Warrant 9 for signals near railroad grade crossings (stop or yield within 140 feet of tracks).

Project Special Provisions & Standard Specs – Milton Dean

- Milton went over all Sections that have been revised or added in the Generic Project Special Provisions. These involve Pedestals, Beacon Controller Assemblies, Junction Boxes, LED signal modules, Pedestrian Signal Heads, Metal and Wood Poles, Accessible Pedestrian Signals, and Wireless Magnetic Sensor Vehicle Detection. See the PowerPoint presentation for detailed information on the PSP.
- Milton also went over some of the proposed changes to the next publication of the 2012 Standard Specifications. One important change involves removing all references to

proprietary or branded products. For example Burndy clamp will be called a parallel groove clamp. A first draft of the Specs is due in January, 2011 with a final draft available on the Department's website in March, 2011. Everyone will have the opportunity to have input to the changes. However, please don't wait until March if you know of items needing to be revised. See the PowerPoint presentation for proposed signal related changes and additions.

Queue Cutter Signal – Rob Ziemba

- Issue of intersection adjacent to railroad crossing and vehicles often stopping on tracks despite warning signs.
- New Warrant 9 in 2009 MUTCD provides criteria for installing a traffic signal at an intersection adjacent to a railroad crossing that otherwise might not meet signal warrants. This can help to clear tracks but still does not prevent motorists from stopping on tracks.
- Ways to try to reduce vehicle queuing: (1) Advance heads as part of intersection or (2) Queue cutter signal.
- Advance heads operate as a timed overlap (wire to same cabinet) stopping traffic before tracks, but allowing throat to clear before completing phase.
- Queue cutter signal also has heads in advance of RR gates but operates by a separate cabinet - still interconnected to intersection signal and also to railroad for preempt. Queue loops are located beyond railroad exit gate in "throat". After a period of steady detection, recognizing the throat is full, queue loops activate, causing heads at RR tracks to turn red and stopping any additional vehicles before tracks.
- See PowerPoint presentation for details and further information.

Plan of Record Updates – Pam Alexander

- Pam went over different scenarios of signal changes and whether, in accordance with TEPPL T-67, a new plan is needed, a plan of record is needed, or, in some cases, neither. If unsure contact the Regional Signals Engineer or Buddy Murr.
- Pam advised that more complete and accurate information from some Divisions would eliminate some telephone calls and emails for necessary information.
- Greg emphasized the importance of having accurate records as we get numerous requests for plans from attorneys and insurance agencies. It's not good if our plan does not agree with what is actually on the ground. Divisions will be asked to verify existing conditions prior to responding to a request from attorneys and insurance companies.
- See "Plan of Record Updates" Presentation for more detailed information on when a Plan of Record is or is not needed and what information should be included when submitting a request for a Plan of Record.

Current Metal Pole Issues – Frank Andrews

- Average 100 structure reviews per month
- Tracking metal signal supports - Currently over 7000 statewide.
- Unless specified the Contractor assumes ownership of removed Metal Signal Poles. Some Divisions are assuming ownership and recycling. This is encouraged but we need to track these poles.

- The Structure Review Group can help qualify used poles and we are working on recertification of Contractor owned poles. It is important to keep records of the Shop Drawings and Foundation Designs of metal poles.
- Important that Division Traffic Engineers are getting records (shop drawings and foundation designs) from Resident Engineer on TIP projects after project is complete.
- All pole submittals should be sent directly to Buddy Murr or the appropriate Regional Signals Engineer.

DTS Reporting Tools and Use in PM Scheduling – Mike Brown

- Mike went over some of the changes that have been made in DTS and there was discussion on the 6 month, 12 month and 24 month PMs.
- The software does not capture retiming when done as emergency maintenance. Mike will investigate this issue.
- Some Divisions said the queries were not giving them the info they needed. Mike will also investigate this issue.
- There have been some requests from Divisions for additions to the software. Mike explained that adding to the program will add to the already rather lengthy synch times and is probably not desirable. Greg emphasized that software was intended to provide certain reporting information and not to become a different tool for each Division.
- There was some inconsistency in the conflict monitor certification reporting. There is a drop down menu from the conflict monitor that should be used to report certification and this is how this information is captured in the report.

R-4701 and Traffic Signal PMs – Greg Fuller

Greg went over some of the results from the latest R-4701 reports:

- The 12-month PMs are at 73% which is down from 82% from the previous year.
- The 6-month PMs are at 67% which is an increase from the previous 61%.
- Signal retiming has increased from 37% to 40 % but this is barely Level-of-Service "D". Greg emphasized the importance of retiming and any timing adjustments made should be counted.
- There was some discussion about the 6-month and the 12-month PMs and Greg said the expectation was that each intersection be inspected twice a year.
- Emergency Maintenance calls have been cut in half (currently 10,400 statewide annually) since the initial R-4701 report which is a direct result of increased emphasis on PMs.
- When performing PMs verify operation of the signal and compliance with the signal plan.

Watchdog Timer & Grounding Resistance Measurement – John Rowe

- John went over the very intermittent issue we are experiencing with Watchdog Timer.
- It has been extremely difficult to reproduce the problem, to investigate it or test solutions. We think it may be related to higher voltages and/or transient voltages.
- Divisions replace the controller after 2nd occurrence with a hard failure.
- Watch Timer issue is still under investigation. See PowerPoint presentation for further detail.
- John discussed proper methods for measuring grounding electrode resistance.

- When using a clamp on tester, it was emphasized that all wires connected to the grounding electrode must be clamped in the meter's jaws for a valid reading.
- A reading of less than 1 ohm is invalid and is indicative of a ground loop in the measurement circuit. In this case, the ground loop must be removed and the clamp on test performed again. Or, the three point test method must be used to determine a valid grounding electrode resistance.
- See PowerPoint presentation for further detail.

Communication Issues – Neil Avery

- Neil went over the scenarios which would require different data cables (CB 137, CB 142, CB 196) and "CB-172/CB-dot"). The CB-172 will need to be sent to the Traffic Electronics Center to have its pin out assignments changed to work with the 2070 Controllers. The modified data cable is then referred to as a "CB-dot".
- Gave instructions on how to obtain the latest software from ENCOM. www.encomwireless.com = Then go to "TOP DOWNLOADS" to get ControlPak Software (Version 4.3.13)
- He also presented the current bid list items for wireless communication materials with prices including special order items.
- Neil gave instructions on how to locate the drivers for use with all 2070L closed loop systems running Econolite's OASIS software on NCDOT systems. Detailed instructions are the end of the Communications Issues presentation.

North Carolina Department of Insurance (NCDOI) Inspections –

Warren Bullock, Risk Manager Supervisor (Electrical Section), Phone: 919-218-7621

- Warren Bullock covered the information needed from NCDOT when processing inspections by NCDOI on traffic signals and ITS devices:
- Type of inspection (traffic signal, camera, etc.) and if it is a partial inspection
- Location of inspection: intersection, mile marker, municipality, or any other information
- The date the installation will be ready for inspection
- The name, phone number, and mailing address of the Electrical Contractor
- The contact info of the power/utility company (contact name, phone number, fax number, work order number, premise number or any other info that will be helpful in releasing power)
- Email and phone your request to the inspector assigned to your area (see attachment)
- If local codes or ordinances require an electrical permit, this will be separate from any NCDOI inspection.

Accessible Pedestrian Signals – Buddy Murr

- The chirp and cuckoo audible tones are no longer allowed at new or upgrade locations.
- An engineering study needs to show need for APS installation. This will be determined by the Division Traffic Engineer and the Regional Traffic Engineer.
- When upgrading signals, you must upgrade audible pedestrian signals to APS.
- Per MUTCD, if pushbuttons are less than 10 feet speech walk messages must be used. If greater than 10 feet percussive tone (rapid tick) must be used.

- Cost is approximately $2500 per pushbutton.
- A dedicated pair of wires is needed for each pushbutton.

TRAFFIC SIGNAL EQUIPMENT ISSUES

Sensys Detection System – Kelvin Peele

- Test sites are Centennial Parkway at Oval Drive in Raleigh and US 301 at US 70 in Selma
- Device is approved and on our QPL
- Division One has had the system in place at 4 locations and they are working as designed. They are planning to install them at 11 additional locations in 2011
- See PowerPoint Presentation for additional information

Oasis/Translink 32 Update – Mark Harrison / Joe Lohr

- Mark Harrison presented the Oasis service report for 2010 which highlighted the major issues addressed and enhancements contained in the upcoming release of Oasis/OSM. Mark emphasized that this release is a major overhaul of Oasis and that many lingering issues of the past few years have now been addressed. It is anticipated that a version should be ready for release in early 2011.
- Joe Lohr briefly summarized issues addressed in the latest approved version of Translink32. The latest version (3.03.03) was handed out on CD to each Division during the presentation.
- Contract runs until July 2015.

Northstar Detectors – Milton Dean

- There was much discussion about problems with Northstar Detectors. Several Divisions expressed they were extremely dissatisfied with their performance and are removing and using detectors out of older NEMA cabinets that have been removed from service.
- Milton Dean reported that, in the past 3 years, we have supplied over 8000 Northstar detectors. Milton reported of the Northstar detectors returned to TEC: 99 units operated properly, 32 were sent for warranty repair and 31 were repaired by TEC.
- We are using the Caltrans specification and need much more documentation than we have so far to take any action with vendor. Divisions are to advise TEC of the issues, inspect the loop installation, and have TEC test potentially defective detectors.
- Consensus is that there is a problem and possibly Northstar detectors are not as forgiving as EDI detectors on existing loops.
- Divisions to send all failed units to TEC.

Span Wire Clamp Failure (Havelock) – Milton Dean

- As a result of a recent failure in Division 2 an email was sent to Traffic Signal Technician Supervisors and Deputy Division Traffic Engineers in February, 2010.
- Divisions are requested to take immediate corrective measures where multiple spans are attached to one pole clamp.

LED Module Replacement – Milton Dean

- At this time, LED modules should be replaced by the end of the 5 year warranty period. The warranty period begins at date of manufacture, not installation.
- Pixilated versions of LED circular indications have been on the street for well over 5 years and need replacing.
- Some pixilated versions of the LED arrow indications have reached the end of the warranty period.
- With the latest contract prices the payback for all colors is less than six months.
- Central Inventory has a procedure for obtaining Gaylord boxes to recycle LED modules. Central Inventory will then pickup full boxes and will deliver them to the recycling vendor.

Polara "Bulldog" Pedestrian Pushbuttons – Madison Phillips

- Madison showed photos and discussed Polara "Bulldog" pedestrian pushbutton.
- The device has limited moveable parts and has indicator light when actuated.

"SignFix" Mounting Hardware – Madison Phillips

Concrete Poles in Rich Square – Madison Phillips

- Madison showed photos of concrete pole installation in Rich Square.
- Potential use in locations where there is space limitations because of guying and decreased footing size.
- We are looking for a couple of other locations to further evaluate concrete poles.

OTHER ISSUES

Payment for Coiled Signal Cable

- No problem with existing method

Potential Changes to Material Specification and Construction Methods

- Divisions will have opportunity for input and we will send to Divisions by end of January, 2011 for comments.

Use of #16-7 Signal Cable and Possible Use of #16-8 Signal Cable

- Consensus is to install separate run of #16-7 for Flashing Yellow Arrow Heads
- Most Divisions are allowing butt splices inside signal heads and are having no problems

Condulets and Junction Boxes

- Junction Box needed every 150 feet
- Junction Box needed within 2-3 feet of pole
- The 2012 NCDOT Standard Specifications and Drawings will require both Condulets and Junction Boxes at loop lead-in connections, railroad preempt, and signal pedestals

NEMA TS-2 Detectors

- After discussion, there is a need for NEMA TS-2 detector cards for maintenance at the remaining NEMA cabinets across the state. ITS and Signals will prepare a bid document for a statewide term contract for NEMA TS-2 detector cards. Items expected to be available by May 2011.